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Landscape-gardening at the Columbian Fair.

IN a late number of *The Engineering Magazine* the editor of the department devoted to architecture, in some final criticisms on the design of the Columbian Exposition, says:

While the landscape-gardening is unquestionably very fine to look at and adds immensely to the appearance of the buildings, it is totally unsuited for practical purposes. Everywhere there was walking, walking, walking; short cuts were impossible, because you were invariably shut off by a lagoon or a lake. People who do not know what landscape-gardening is, must, after the Fair, think it something very dreadful, based on the idea, if possible, of making people go twice the distance to reach a certain point when they might only go half by going another way. It is very beautiful, we admit, but very horrible to the sight-seer. An architect does not make a design irrespective of the uses to which his building is to be put; that must determine its ultimate form. By neglecting this elementary idea in the laying out of the Columbian Exposition the art of landscape-gardening has been degraded in the public estimation, and from a noble art for a noble purpose has shown itself incapable of realizing the fundamental elements of all work of practical utility.

Now, it is true that the test of any work is its utility, and if the design of the Exposition failed in this critical point some one is reprehensible. Mr. Burnham's report as Director of Works, which was published more than a year ago, and Mr. Olmsted's report to the American Institute of Architects, have been very generally read and commented upon. From these and other accessible documents it is a matter of public knowledge that Messrs. Olmsted & Co. were officially employed before the architects or any other artists were called in, and when consulted as to a site they recommended one north of the city, along the lake shore, where it would have required a smaller outlay to prepare the ground and means of interior transportation, where a simpler arrangement of the buildings could have been made, and where they would have had a more agreeable setting in foliage, already provided by standing woods. The Committee of the Directory, however, found that the railroad companies concerned would not subscribe a sufficient amount to provide adequate transportation between the city and the Fair grounds. Thereupon, Jackson Park was taken as the only available place left on the lake-front, and Jackson Park was only to be had on condition that after the exposition it should be returned to the Park Commission in as good condition for their purpose as it was when taken from them.

Twenty years before, this site had been reserved as a park, and was probably one of the most forbidding spots in the United States. Messrs. Olmsted & Vaux, who were not consulted in selecting this site, were afterward called in to devise a plan to make it available for a public pleasure-ground. Part of their design was to begin at the lake and re-open certain old lagoons, taking the excavated material lifted out of their bottoms to form undulating banks, and these were afterward to be covered with soil and masses of vegetation. This scheme had not been carried out to the full in accordance with the intention of the designers, but a good deal of work had been done. The excavation for the lagoons, and for what afterward became the main basin in the Court of Honor, had already been made, and the wooded island and other prominent features already existed. It will be seen, therefore, that the problem was very different from the one which the critic above quoted assumes that the landscape-gardeners had before them. The lagoons of which he complains, with the other general features of the park, were not only there, but they had to be maintained without any serious modification. Now that the Fair is over, we can judge whether the interruptions to direct communication between the buildings caused by the lagoons had any adequate compensation. Did the added beauty which these waters gave the scenery, and the restful, convenient and delightful mode of transportation to different parts of the grounds which they furnished by means of sixty boats—not to mention the fifteen bridges—did these outweigh the disadvantage caused by these separating water channels? This is a question upon which intelligent men might differ, although the single dissenting voice we have yet heard is that of the critic above quoted, and the practically unanimous verdict of the cultivated public has been that the compensation was complete. There was nothing in the whole Exposition by which visitors were more fascinated, or which they remember with more vivid pleasure, than the use of the boats and the enjoyment of the general panorama which the boats and the shore-walk opened. A large proportion of those to whom we have put the question have said that the enjoyment of the scenes near and distant, the foregrounds and perspectives which were made available by the boats and the walks along the shore, exceeded every other pleasure enjoyed at the Fair.

Should we ever have another exposition we shall, no doubt, construct it on a smaller base. We shall set higher standards, which will exclude, perhaps, one-third of all that was exhibited in Chicago, and in this way we shall lessen the space occupied and the amount of ground and floor to be walked over. We shall have fewer and larger buildings, with restaurants and refreshment-stands within them, instead of multiplying small ones outside. This will obviously be more economical, and the general result will be grander and more convenient. This, it may be well to repeat, could have been accomplished on the site preferred by Messrs. Olmsted & Co.; but, taking Jackson Park as it was, experience has proved that the designers skillfully overcame the disadvantages growing out of the devious courses of the walks as compelled by the lagoon features, and that the losses were more than met by the gains in other respects. Our own judgment is that, besides the incomparable addition to the beauty of the scene which these interior waters furnished, they afforded facilities for carriage from building to building which it would have been hard to excel on any other plan.

We have seen no evidence that "the art of landscape-

gardening has been degraded in public esteem by the laying out of the Columbian Exposition," and the critic who makes the assertion has plainly formed his own opinion on incorrect assumptions. But inasmuch as he invites attention to the superiority of architecture over the art of landscape-design, as if there were some conflict between them, or at least some difference in their aims and motives, it may as well be said here that not only the possibility, but the inestimable value, of single-minded co-operation between these two arts was exemplified at the Exposition as it never was before. Not only architects and landscape-gardeners, but all men, are prone to suspicion and jealousy, especially when they divide off into classes and professions, but the artists of the Fair were sufficiently broad-minded to rise above this tendency. If there were any such errors in the general design as this critic charges, the representative architects had ample opportunity to correct them. It was Mr. Root who grouped into one drawing what had been previously sketched in a detached way by Mr. Olmsted and Mr. Codman; and during all the time of the development of the design there was the most cordial and spontaneous intercommunication between all these artists. Neither Mr. Hunt nor Mr. Burnham discovered that there was anything in the design which was to degrade art in public esteem. In the preliminary stage they fully accepted the leading motives of the landscape-gardeners, who, on their part, were eager for suggestions looking to the improvement of the design, and so far as the public is aware there is not one which the architects maturely advised which was not incorporated in the plan. In short, there was not a shadow of suspicion or antagonism between the two arts, and the Exposition ought to be the seal of a permanent alliance between them. The efficient co-operation of these allied professions is one of the most happy results of the Exposition. It is greatly to the credit of both, and of excellent promise for the future of all art in this country.

Fences.—II.

WE spoke recently of iron and stone fences as they are commonly seen in American country towns. It would be impossible to enumerate all the different types of wooden enclosures employed in various parts of the country, but one or two may be named as of special importance. One of the most simply sensible is the old-fashioned paling with narrow pointed uprights set somewhat closely together. Such a fence is unpretentious, yet not rustic in character, and is therefore appropriate, for example, around a farm-house lawn or garden, or along the street-line of a village. Where little protection is needed it can be kept so low as to be unobtrusive, and where a high fence is required it will not look forbiddingly solid. More grace may be given it by the simple device of graduating the palings in height so that their tops will form symmetrical curves, highest where they are attached to the post, lowest in the centre of the spaces between the posts; and then if a few vines are allowed to clamber up the palings a pretty and refined effect is produced. Another good expedient is to build a wall of stone or brick, two or three feet in height, and crown it with a low, light paling; and this form of fence is especially sensible when the ground within it lies a little above the street level, so that the courses of stone or brick form a retaining-wall.

In old New England towns we often see wooden fences of a somewhat less simple character, made with strong moulded copings and posts and a moulded top-rail supported by slender bars, square or diamond-shaped in section. Good designs for fences of this sort could be easily carried out by village workmen; and they might advantageously replace the plain paling around houses of the better type or unpretentious villas. Of course, they also afford a good support for vines, although their more architectural character renders this drapery less essential.

A pretty type of fence, which is distinctively American, has lately grown in favor. This is the so-called "rustic" fence, built in open-work panels, with the branches of trees from which the bark has not been removed. Straight pieces are taken, of course, for the posts and the main horizontal bars; but the panels are then filled with more or less fanciful designs, in forming which the natural forkings of trees can be utilized. Such a fence is most interesting when each panel shows a different design; but in attempting this variety pains must be taken to give all the panels a similar degree of solidity. If one is built with thick branches or a very close pattern, and another with slighter branches or a more open pattern, the fence will have both an unstable and an inharmonious look. Therefore, unless the builder has a certain amount of artistic instinct, it is safest for him not to try for much variety and to resist the temptation to use natural forkings; it is safest to confine himself to one or two rather formal patterns which can be easily built with straight pieces of wood.

Red Cedar is the most effective wood to use for fences of this kind, especially where a fanciful variety of forms is desired, its odd forkings and twistings and the shreddiness of its bark accentuating rusticity of effect. But the White Cedar likewise offers good material of a similar kind; Pines furnish surfaces of fine color and a pleasing roughness, which, moreover, look better than Cedar-bark after a few years' exposure; the smooth gray limbs of the Beech are attractive in another way; and the white bark of the Canoe Birch, and especially the shining gray or golden bark of the Yellow Birch, have a charm peculiar to themselves. The character of the wood should, however, always be considered in determining the panel-forms of a rustic fence, the smooth surface and almost architectural regularity of the branches of the Beech, for instance, prescribing more formal patterns than the shreddy surface and contorted shapes of Red Cedar branches.

Fences of this description are rustic in expression as well as in name, and look best, therefore, in pronouncedly rural situations. They are appropriate for the vicinity of those small houses, built in part or altogether of logs or unbarked slabs, which are now so common in our mountain districts, and even for more ambitious summer cottages, while, of course, they may fittingly protect the outlying portions of even a large estate, giving way to something more architectural near the buildings. The serious objection to the rustic fence is, that unless framed and joined in the most workman-like manner, the pieces will draw apart under our trying weather, and the whole structure will soon be ricketty.

Where stone cannot easily be had, a beautiful wall may be built of brick, as no one needs to be told who knows the rural districts of England. But the high English brick wall is out of character in an American landscape, whether this means a closely built street of villas or a succession of larger country places. The Englishman loves privacy, seclusion, above all else, and seems not to enjoy anything he owns unless it is pretty well protected from the eyes of others. But the more sociable, less sensitively shy American likes to have his neighbors see his lawns and gardens, and likes to see theirs; and if by chance one individual feels differently and surrounds himself with a seven-foot wall, it strikes a distinctly discordant note amid its surroundings. On the other hand, the recent tendency, shown in many New England towns, to do away with fences altogether and let lawn and garden blend unprotected with the grass-bordered street, cannot be commended from the point of view of good taste. We may not need really to protect our private domains; we may not wish to shut out others from the enjoyment of their beauty; but we should want them to look like private domains, not like bits of common-land; to look as though they were cared for by some particular hand; as though they were adjuncts to a home. High palings and, still more, high solid walls would greatly injure the beauty and peculiar expressiveness of a pretty American village; but low walls, palings or hedges, if well built and neatly kept, make the village much more charming than entire openness.

The merits and demerits of hedges, and the best plants to use for them in various parts of our country, are questions which have often been discussed in GARDEN AND FOREST. Therefore little need be said about them here, except to note the fact that, while they are the most beautiful of all fences where solidity is desired, they are the most difficult to create, and much the most difficult to keep in order. He who builds a fence of stone or wood does the work quickly and need anticipate little trouble with it for years to come. But he who plants a hedge must wait long for it to attain the desired height, carefully coaxing it meanwhile into proper shape; and when a good result has been obtained, he must yearly take pains to keep it in proper condition and always dread that individual plants may die out, leaving gaps which, again, it will take years of growth to fill. Our climate is less favorable to hedges than the moister, more equable English climate; and there is as much to dread from the suddenly hot sun of early spring and the drought of midsummer as from the excessive cold of winter. Except in sheltered situations, therefore, it is a risky experiment to try to raise a tall hedge. But low ones are more easily managed, and accidental gaps in them are more easily repaired. Of course, evergreen plants are much more desirable for this purpose than those which shed their leaves the first autumn; but, as a finish to a retaining-wall, even a thick little leafless hedge does not present a bad appearance in winter.

Notes on some of the Texas Trees.

ÆSCULUS ARGUTA is generally a shrub three to five feet high, but sometimes a small tree twenty feet high, with a thick trunk and a dense head. The leaves have five to seven, and sometimes eight, leaflets; the flowers are in dense and erect racemes, covering sometimes the whole bush; they are of a pale yellow color, appearing in April, at the same time as the leaves. The fruits, covered with short prickles, are of a russet color, and the leaves fall early in the season. The shrub is often really beautiful as seen growing in the woods on limestone bluffs. Its popular name here is Buckeye. [This is usually considered a form of the Ohio Buckeye, Æsculus glabra.—ED.]

SAPINDUS MARGINATUS is a tree sixty or seventy-five feet high, as found in the rich bottom-lands, but generally of much smaller dimensions in less favorable situations. The flowers, which are small and white, are borne in large compound racemes, terminating the boughs. They appear in June, and are succeeded by large berries of a transparent yellow when ripe, and remaining sometimes a whole year. The leaves turn to bright yellow in autumn. The wood is yellow also, but it never has been used to any extent, economically. This tree has a fine appearance, as the flowers and fruits are quite ornamental. It is very rarely seen in cultivation, and is known all throughout Texas as the Wild China-tree.

RHUS COPALLINA, VAR. LANCEOLATA, seems to be quite different from the type, and may prove a distinct species; it is generally a shrub five or ten feet high, but frequently reaches the height of twenty-five feet, with a trunk six inches in diameter. The leaflets are elongated, the flowers of a pale yellow color in July and August, and afford a good pasture for bees at a time when flowers are scarce. It grows abundantly on all the bluffs and prairies of limestone formation. The true Rhus copallina here is a small shrub, reaching hardly a height of eight feet at most, with a body of one or two inches through. The leaflets are ovate; the flowers are in smaller thyrses and appear in June, and the plant occurs only in the sandy regions. The ripening foliage turns to a bright scarlet, so that the tops of the bluffs where this Sumach grows in dense masses fairly flame in autumn.

SOPHORA AFFINIS is an elegant small tree, twenty or twenty-five feet high, with a trunk six to eight inches thick, though it does not generally reach these dimensions. I have seen specimens with a trunk not exceeding two inches in diameter reaching the height of thirty or forty feet, by taking for support neighboring trees, such as a Red Cedar or Oak. The leaves, with numerous leaflets, are a very dark green and persevere late in the season. The flowers resemble those of Robinia Pseudacacia, and are disposed in simple pendulous racemes, to which succeed long black and moniliform pods that are quite as ornamental as the flowers and remain on the tree more than a year. Although that tree has many points to recommend it for decorative purposes, it is not in cultivation in Texas, and if it has a common name I have never heard of it.

PROSOPIS JULIFLORA, the well-known Mesquit-tree that grows all over the prairie region of Texas, where in many localities it affords the inhabitants their only fuel, is generally small and scrubby, although it may grow to the height of thirty feet, with a trunk two or three feet thick. The blackish wood is compact and nearly incapable of decay. It makes excellent charcoal, and is used for posts, though invariably crooked. The principal streets of San Antonio have been paved with blocks of Mesquit-wood, and a good road-way it makes. Generally, twice a year the Mesquit bears a heavy crop of beans, full of saccharine matter and very nutritious. They are relished by horses, cattle, sheep and swine alike, and in many instances they constitute the only attainable food in dry seasons. The tree endures any amount of dry weather, and it never fails to bring its crop. I have never seen it in cultivation, although its pendulous compound leaves and racemes of yellow flowers are quite elegant. It would not be a good shade-tree.

BUMELIA LANUGINOSA is a thorny bush in dry upland, and in rich bottom-land a tree forty feet high, with a short trunk. As an ornamental it has nothing in particular to recommend it; but its dense yellow wood, with peculiar marking, is likely to prove of great value to the cabinet-maker. It is here known as Shittim.

Dallas, Tex. *J. Reverchon.*

Foreign Correspondence.

London Letter.

CHRYSANTHEMUMS.—There are more exhibitions of Chrysanthemums than ever in England this year. Our horticultural journals are entirely taken up with reports of the shows, and cultural and other information about the plants. Every park and public garden of any pretensions hold a special exhibition of Chrysanthemums; even Kew taking a leading part by providing a show of plants, grown on the "natural system," and it is evident from the crowds of visitors who throng the houses where the Chrysanthemums are, discussing the points, the colors, the decorative value and the extraordinary variety in the form and size of the flowers, that such exhibitions have considerable value in affording pleasure, if nothing else. A prominent nurseryman remarked to me a few days ago that the Chrysanthemum is the poor man's plant, by which, no doubt, he meant that the Chrysanthemum is the plant which, above all others, every one can grow with ease and be certain of a certain amount of floral display, however poor the treatment be. This universal interest in Chrysanthemums finds expression in the numerous exhibitions held, and in the crowds which visit them. The National Chrysanthemum Society, whose exhibition took place this week in the Royal Aquarium, Westminster, has had its hands full in preventing the crush of spectators from wrecking the exhibits. Some of my friends who went to see the exhibition came away without having obtained more than a bird's-eye view from the gallery, not daring to venture among the crowds that surrounded every exhibit on the floor below. "At least equal to any Chrysanthemum exhibition ever held in England" was the general verdict with regard to this last one, and after the favorable season we have had, together with the value of the prizes competed for, this is only what might have been expected. The bad features which spoil such exhibitions were prominent enough this year; I al-

lude to the trained sugar-loaf specimens, the tall mop-like plants in the groups, the "trussed" cut-blooms, some of which, I learn, took as much as half a day to dress—that is, to curl and place the florets in position, so that the flower should pass muster with the masters of the art. When flowers require this amount of dressing for exhibition, one is inclined to quarrel with those who tolerate it. However, these objections notwithstanding, the Aquarium this year contained some wonderfully good collections of cut blooms. The Japanese varieties ranked a long way first, both in number and in attractiveness. The first prize collection of forty-eight distinct varieties was a superb one, and as it contained the cream of the Japanese sorts shown this year I give the names: J. S. Dibben, Etoile de Lyon, E. Molyneux, Stanstead White, Mrs. E. W. Clarke, Thomas Hewitt, Van Der Heede, Thomas Selwood, Viviand Morel, W. H. Woodcock, Mrs. Adams, R. C. Kingston, Colonel W. B. Smith, Julius Roehrs, W. H. Lincoln, Duke of York, Violet Rose, Sunflower, Potter Palmer, Miss D. Shea, Seedling, G. C. Schwabe, Florence Davis, W. W. Coles, Madame J. Laing, Mrs. F. Jameson, C. W. Wheeler, Mademoiselle Marie Hoste, W. Tricker, Miss M. Scott, Puritan, Charles Davis, Miss Anna Hartzhorn, Beauté Toulousaine, E G. Hill, W. Falconer, Charles Shrimpton, Mrs. Alpheus Hardy, Rafello Marshaletta, Mademoiselle Thérèse Rey, Robert Owen, Louis Boehmer, Beauty of Exmouth, Vice-President Calvat, Autumn Tints, Gloire du Rocher, J. Shrimpton and Charles Blick. The exhibitor was W. H. Fowler, Esq., J. P., who was equally successful as an exhibitor last year. Incurved varieties were exceptionally good in form and color, but, if anything, they were a little smaller in size than usual. The first prize for thirty-six varieties in this class was won by F. A. Bevan, Esq., the following being a list of his collection: Lord Alcester, Prince Alfred, Princess of Wales, Alfred Salter, Lord Wolseley, Mr. R. King, M. Bahaunt, Queen of England, Violet Tomlin, John Lambert, Alfred Lyne, Empress of India, R. Cannell, Mrs. Coleman, John Salter, Miss Haegas, Princess of Teck, Ami Hoste, Jeanne d'Arc, Lady Dorothy, Golden Empress of India, Hero of Stoke Newington, John Doughty, Barbara, Mr. N. Davis, Cherub, Lord Eversley, Charles Gibson, Mrs. Heale, Princess Beatrice, Nil Desperandum, Empress Eugénie, Mrs. Halliburton, Refulgens, White Venus and Madame Darrier.

The Anemone-flowered varieties, certainly the most wonderful from a morphological point of view of all the wonderful freaks of the Chrysanthemum, were represented by some superb collections. Some of these flowers, if given to a botanist unacquainted with them, would probably puzzle him. The first prize collection was exhibited by E. C. Jukes, Esq., and was generally considered to be the finest lot of Anemone-flowered varieties ever exhibited. The sorts were: Fabian de Maderanaz, Lady Margaret, Mrs. Judge Benedict, Monsieur Pankouche, Sabine, Minnie Chate, Ernest Caille, Nelson, George Hawkins, Cabrol, Mademoiselle Nathalie Brun, Grand Alveole, Ratapoil, Madame Lawton, Fleure de Marie, Delaware, Le Deuil, Gladys, Spaulding, Jeanne Marty, Annie Lowe, Madame Berthe Pigny, Rodolphe Ragionière, Empress and Marie Loglaise.

The "hybrid" classes, such as Japanese-incurved, Japanese-Anemone, Anemone-Pompon and Large-flowered Reflexed, were also well represented. The Pompon varieties have ceased to find many admirers among growers of Chrysanthemums, and, although several good collections were shown, they attracted little attention. The finest flower shown, in my opinion, the most striking and most attractive, was Edwin Molyneux, in which opinion I have the support of Mr. Cannell, who declares that it has no equal among large-flowered sorts. Not only are the flowers of first-rate merit, but the plant is sturdy in habit, has handsome leaves and flowers freely, while it lasts several weeks in perfection. Grown on the "natural" system, it makes a most picturesque specimen. There are several examples of it in this character at Kew, plants a yard high, with leaves down to the soil, and bearing a dozen or so fine flowers. I am afraid many of the favorite exhibition kinds are not nearly so good in this respect. There were several collections of "naturally trained" plants shown, a prize having been offered for such plants, each to bear not less than twelve flowers. They were, of course, not really naturally grown, as pinching, disbudding, staking, etc., had been done in moderation; still the plants looked less unsightly than the "gingham"-shaped standards or the spruce pyramids with their flowers wired into position like buttons on a cushion. Verily, the Chrysanthemum is a long-suffering plant; it may be twisted, contorted, cribbed, cabined and confined to almost any extent, and, after it all, will flower as good-naturedly as if left to its own happy way.

The varieties to which first-class certificates were awarded were the following: G. W. Childs, although not before certificated, this is now a well-known Japanese variety. It is of American origin, and has crimson flowers. Golden Wedding, Japanese, of American origin; flowers large, soft golden-yellow. Rose Wynne, a large-flowered Japanese variety, colored soft rose. Elsie Neville, a single-flowered Japanese variety with long fluted florets colored crimson, the disk yellow. Mrs. C. J. Salter, a compact Anemone-flowered variety, colored golden-buff, with a rose tinge. W. W. Astor, a large Japanese Anemone-flowered variety, the long ray florets colored soft rose, the disk florets long, colored rosy yellow. John Bunyan, also a Japanese Anemone-flowered variety, colored soft yellow.

London. *W. Watson.*

Plant Notes.

Pueraria Thunbergiana.

PUERARIA THUNBERGIANA, a native of central and southern Japan and central China, is a woody climber, and the only representative of its genus. It bears large three-parted leaves with very long petioles, and broadly obovate, pointed, dark green leaflets, short compact racemes of fragant, violet-colored, pea-shaped flowers, and brown hairy pods. In some parts of Japan this handsome plant is exceedingly common; it does not grow, however, farther north than the centre of the main island, and appears to be confined to elevations of about 1,800 to 2,500 feet above the sea-level; and is nowhere more abundant than among the Hakone Mountains, beloved of tourists, who often get their first impressions of Japanese scenery and vegetation among the hills and lakes of this charming and accessible region. Here Pueraria is so abundant that in August the air is perfumed with the delicate fragrance of its flowers as it hangs with its long stems swaying backward and forward on the face of some Fern-covered precipice, dripping with the spray of the water-fall, or sends them to incredible distances, climbing through bushes or into the tops of low trees.

In Japan, the Kudzu, for so this plant is called, has some economic value; the thick and fleshy roots furnish a starchy meal, which is used as food; cloth is made from the inner bark or bast of the young shoots, which is removed by boiling and macerating in water; and the dried stems and leaves furnish a considerable part of the hay cured by the Japanese. It is probably as an ornamental plant only that Pueraria will be used in this country. As such it has considerable value here, even in climates sufficiently severe to destroy its shoots annually. We remember no other vine-like plant which grows so rapidly, or one that can cover so large a space in a single season. It is well suited to conceal unsightly objects, to train over verandas, or to plant among shrubs and trees when it is desirable to form thickets; and rocky banks or grassy slopes may be clothed with it. Where it is not killed back in winter, the beauty and fragrance of its abundant midsummer flowers add to the value of this plant.

Pueraria Thunbergiana was sent to the United States many years ago by Thomas Hogg, and it has been distributed by nurserymen under the name of Dolichos Japonicus. The

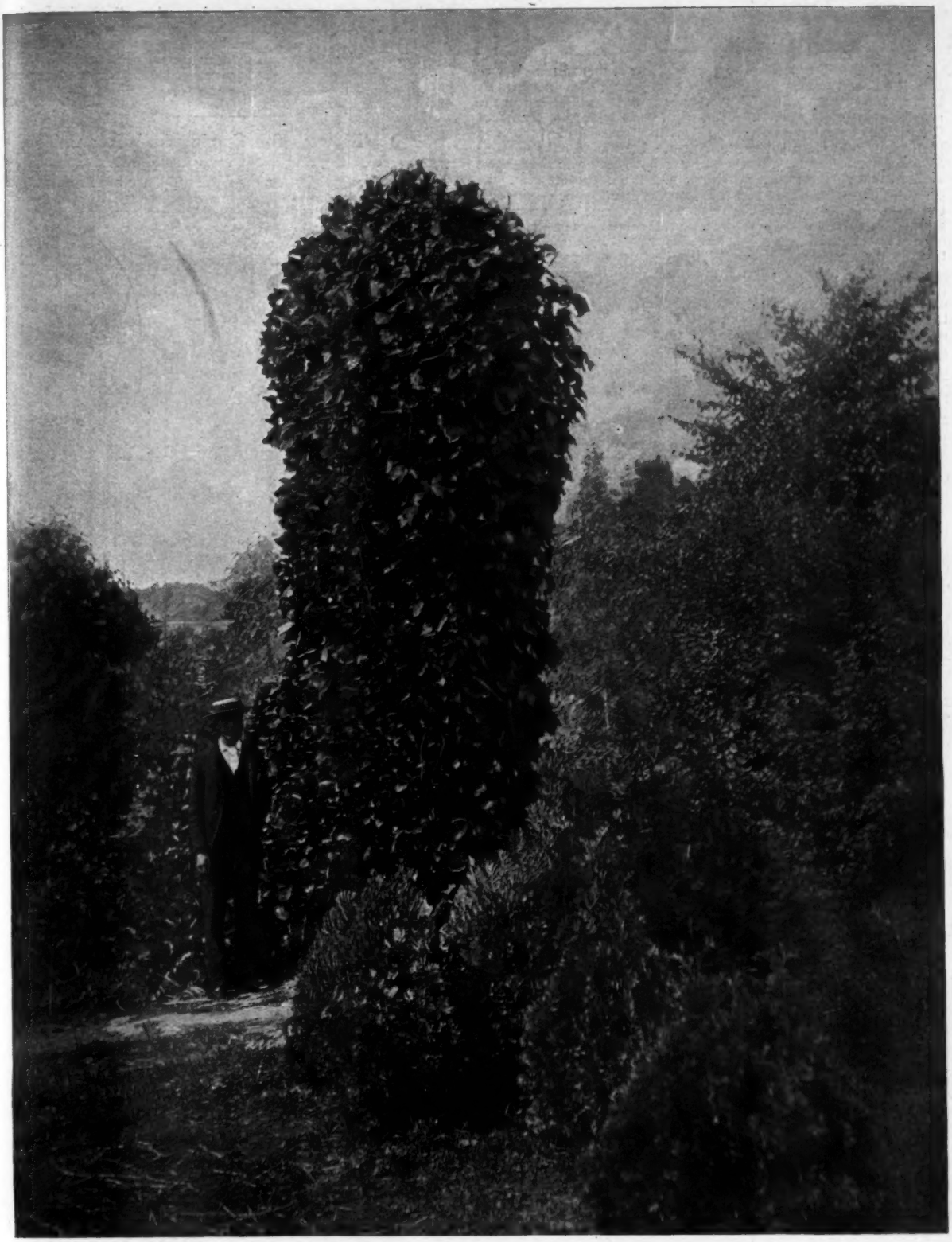

Fig. 74.—Pueraria Thunbergiana, in Germantown, Pennsylvania.—See page 504.

plant illustrated on this page is in the Meehan nurseries at Germantown, Pennsylvania, where it climbs over an old Cedar-tree. It was propagated from one of the plants brought to the Centennial Exhibition in Philadelphia by the Japanese, who used them where they wanted a rapid growth of foliage. At first this plant died back to the ground every year, but a few woody stems now survive the winter and flowering branches grow from these.

Cultural Department.

Greenhouse Work.

AFTER the Chrysanthemums are past, a reorganization of the greenhouses is generally necessary; the space lately taken up by those plants is now vacant and available for the regular winter occupants. Our whole stock of old plants of Chrysanthemums is taken out of the beds and pots and planted in cold-frames for the winter. Last winter these were frozen for two months, but we never had better cuttings than we had this spring; they appear to like the complete rest. In planting care should be taken to leave a good space between the rows, as some kinds are apt to throw out underground shoots, and the varieties may become mixed when the time comes to take cuttings. For late cuttings for bench-planting in June these stock plants will bear topping in April; this will give another crop in May, the second or third week. It is preferable to keep the scarce varieties in a cool greenhouse, so that they can be propagated during early spring. Now that the one-bloom system is so much in favor, the carrying over of considerable stock is absolutely necessary to enable one to take such a large quantity of cuttings at a given period.

All tender plants that have been in frames should now be removed to the greenhouse and placed in winter quarters—Azaleas, Ericas, Primulas, Cinerarias, Freesias, Cyclamen, Calceolarias, Lachenalias, and all such plants that are liable to injury from cold, such as we may experience any time now. For fumigating plants that are liable to aphides during winter we have for some time used the tobacco-leaf instead of the stems or mid-rib. The leaf is a damaged grade that costs from eight to twelve cents a pound, and is the cheapest fumigating material we have found yet, inasmuch as a very small amount of this tobacco is sufficient to kill the insects, a smaller volume of smoke is required since it is so much more pungent, and in our experience of over two years with this material not a plant has suffered from scorching, an occurrence quite common when so much smoke was needed to kill. A slight periodical smoking, say, once in ten days, is far more effectual than waiting until the insects are very abundant. During the winter months the conditions are very favorable to the increase of green fly, and these give place in summer to the black fly, which is much harder to kill by fumigation, but is very susceptible to a weak solution of Fir-tree oil.

During the past year or two the Carnation rust has been pretty well disseminated throughout the country; indeed, it is very hard to secure a good stock of Carnations free from disease. We bought the rust two years ago with a new variety, and our experience is by no means unique. The easiest way to check it that we have tried is spraying with Fir-tree oil, using the mixture warm and of the same strength recommended for mildew. This same solution has proved an effectual cure for one of the worst cases of mildew on Roses I have ever had to deal with.

Where a number of Rubber-plants are used for decoration, there are always some that have lost their lower leaves and look dilapidated; these should be topped now and the portions of the stem having foliage can be cut into lengths and propagated, and at least two-thirds will root if put in at this time. It is a good plan to place the newly made cuttings in dry sand for a few hours, when the milky sap will coagulate and seal over the cut and aid considerably in root-formation. It will be found also that the more abject the old plant the better the cuttings taken from it will root. Strong, unripened wood of Rubber-plants rarely root freely; cuttings taken a year ago are now most serviceable plants, about two feet high; after rooting the young plants need liberal treatment, as they are gross feeders.

Poinsettias (Euphorbia pulcherrima) are now developing their bracts, and need abundant liquid nourishment to develop them to perfection and to enable them to retain their foliage. The Poinsettia is a very valuable plant for Christmas decorations, and repays any care bestowed on it. When used in a cut state they should be cut three days before they are wanted, and the stems immersed their whole length in a tank or bath. Enough water will be absorbed in this time to make them keep fresh through any ordinary period, and the same treatment will apply to E. Jacquinæflora equally well.

The garden varieties of Amaryllis are now becoming very popular, and will be even more so as their merits are better understood. This is a good time to obtain seeds of a good strain and sow them in a gentle warmth. Seedlings will flower two years from now if treated liberally and grown on without check. After the flowering period is reached an annual rest will be necessary at this time. The pots should be placed in a temperature of about fifty degrees, and kept moderately dry until growth commences in spring, when they will need potting in new soil, the old exhausted soil being shaken out. A packet of Amaryllis-seed, costing one dollar, will give about fifty plants. I have found that imported bulbs take as long to establish them as is needed to raise and flower seedlings, and the quality of the latter is far superior.

South Lancaster, Mass. *E. O. Orpet.*

Flowers for Cutting in Winter.

EVEN a small conservatory, when skillfully managed, has great capabilities for giving a supply of cut flowers in winter, and its usefulness can be much extended by using in connection with it a slightly warmed or protected pit or frame, where a reserve stock of cool-house plants can be stored until needed. Among such plants may be named Azaleas, both of the Indian and Ghent varieties; Gardenias, Genistas and Acacias, all of which can be safely kept in a temperature of forty to forty-five degrees until needed for flowering.

In a very small house it is better not to experiment to any extent with Roses, as only moderate success can be hoped for with most varieties when grown among a miscellaneous collection of plants. If, however, one end of the house or a section of a bench can be spared, a careful grower ought to grow Roses fairly well.

Carnations may be grown outdoors to advantage during the summer, and when lifted and potted in the fall can be stored for a time in the pit or frame. In this way a regular supply of these useful flowers can be assured. Bouvardias should be treated in the same way for the summer, but after being lifted they require a higher temperature, and, therefore, had better not be placed in the frame. If kept warm and treated to a little stimulating food occasionally, the plants will soon become root-bound, when they will flower freely all winter long. Stevia serratifolia and Eupatorium riparium both give useful flowers for mingling with other and more showy kinds, and both are very easily managed. All they need is plenty of light and water. Many of the Begonias are indispensable, B. Saundersii, B. manicata, B. nitida, B. semperflorens, B. incarnata and B. Gloire de Sceaux being among the most satisfactory. These are all practically ever-blooming sorts, and can be grown by any one.

The double white Chinese Primrose is an excellent plant for cutting, but the Primroses do not like to have their leaves wet often, and an error on the dry side is easier to remedy than overwatering. A few plants of Cyclamen Persicum will produce a great number of flowers, which stand well when cut. Dutch bulbs are a great help to the cut-flower supply, and should be brought on as required. Freesias, Roman Hyacinths, Daffodils and Tulips are the most useful, and all of them should be well-rooted before being brought into heat. Crassula lactea is a succulent which produces only one crop of flowers in the season, but that crop is an abundant one, and the large clusters of flowers are very pretty. The plant should have full sunshine, but should be watered sparingly during the winter. Every cutting, or leaf, even, will be sure to root and form a plant if laid on a bed of partly dry sand in a warm house.

As the plants are brought in from the pit the Azaleas and Genistas will be found the easiest to force, while the Gardenias will take a little longer. Of the Acacias, A. Riceana is probably the earliest to bloom, and is a particularly pretty one.

Holmesburg, Pa. *W. H. Taplin.*

Cypripedium insigne.

IT is now about seventy-five years since the introduction of this fine old plant, one of the first tropical Cypripediums to be cultivated, and preceded only by C. venustum, which it has long surpassed, in the estimation of cultivators, even in the original form, while numerous superior varieties have been found among importations of what is called the Montanum type. It is from this recently introduced section that the beautiful yellow form called Sanderæ was obtained, and which is now a much-prized plant in the very best collections.

On their arrival imported plants of C. insigne are of rather unpromising appearance, but heat and moisture speedily transform them into growing plants full of life and energy, and which are altogether more thrifty than portions taken from an old-established plant that has been long in cultivation. Plants imported from India two years ago are now vigorous, and flowering for the first time in six-inch pots, many having three flowers each. A very marked feature in this new strain is the width of the white margin in the upper sepal, and the spots are often large and distinctly superior to the old forms so common in gardens. A comparison of Philbrick's variety

of C. insigne and the newer ones shows that many of these are equal to that fine sort, if not superior, while all are desirable if only for their variety, for all are dissimilar.

The varietal name Montanum suggests that the plants were of alpine origin, but this is true also of the older C. insigne, and hence the treatment of one applies equally well to the other.

It is sometimes noted that C. insigne is easier to grow than to flower well. This is the result of too much heat during winter, and a cool house, where frost is just excluded, will grow this plant and flower it far better than a warm house that excites the plants into making an early growth in spring, and a second growth in late summer, when it ought to be preparing to flower. During summer the plants will thrive well out-of-doors in a cool shady place, and should be taken in during September. Grown in this way, the full benefit of the night dews is had, but the pots should be stood on a bed of coal-ashes to prevent the ingress of worms.

Another point worthy of note is that this is one of the few Orchids that will thrive equally well in a compost of loam or the orthodox fern-root and sphagnum mixture. In either case, perfect drainage must be assured, as the plants should not be disturbed but once in two years unless they get into bad health, which seldom happens. Cypripediums are all alike in one respect—they never should be allowed to become dry at the roots. There are no storage vessels in the way of pseudo-bulbs for the plants to fall back on, as with most of the other genera, and slight neglect in watering shows at once in the loss of foliage, and no little time is required for the recovery of the plants after they have received a check of this kind. As a window-plant there is a future for C. insigne when it becomes more generally known, as the flowers last three months in good condition, and this during the most dreary months of the year, commencing with November.

South Lancaster, Mass. *E. O. Orpet.*

Late Ornamental Fruits.

IF the necessary ground in the garden can be spared, or if the circumstances of residence make it particularly desirable to have the shrubberies attractive in very late autumn, a most interesting feature may be produced for the Thanksgiving season by planting a group of shrubs with bright-colored, showy and persisting fruits. Many of the conspicuous-fruited species are not notable for any particular beauty of flower, so that in making such a collection it is necessary to do so at some sacrifice of summer bloom.

In some species which show beauty of fruit after the leaves have fallen the flowers are small and greenish, and while in others the coloring may be more attractive, in some the blossoms are too minute to be showy; and, altogether, there are few which are valuable both for the beauty of their flowers and the brightness of their fruit in late autumn. Most of the shrubs which are desirable for the effectiveness of their fruits in late autumn have these fruits of a red or scarlet color, or a color approaching these. Presumably this color is one most attractive to birds and other animals upon which most fleshy fruits are dependent for dissemination.

The Winterberries, or species of Ilex belonging to the Holly family, are among the best-known and most valued of red-fruited species for late autumn adornment. The native Ilex verticillata and I. lævigata are especially valuable, the former usually fruiting more profusely than the other, and a clear yellow-fruited form is also occasionally found. In size and color the fruit does not differ much from that of the true American Holly, I. opaca, but, while the bright red fruit of the latter is partly hidden by the persistent evergreen leaves, the Winterberries lose all their foliage comparatively early in the autumn. Other American species of the genus also have attractive fruit. I. Sieboldi, from Japan, is a perfectly hardy species of much promise, and although its fruits are small, they are very abundant and not clustered, but thickly scattered among the branches.

The species of Spindle-tree, or Evonymus, are also widely known, but, except the common European species, E. Europæus, most of them drop a large proportion of their purplish crimson pods and enclosed scarlet arils before the 1st of December. One or two Japanese species still hold enough to make them noticeable. The open pods of E. Europæus have faded considerably, but the fleshy arils or "seeds" are still as bright as when first exposed.

The Bittersweet, Celastrus scandens, which is closely allied to the Evonymus, is indispensable as a showy fruited plant. After the first frosts, and when all leaves have fallen, the rich orange-colored pods open and display the scarlet interior. The color keeps bright for a long time, and unless the fruits are devoured by animals the valves of the pods are the first to fall away as the winter advances. As this plant is a twiner, it will not thrive well unless given a pole or stake for support, or is allowed to climb among the branches of some tall shrub or small tree. The fruit is produced in large clusters, in this respect differing very markedly from the Japanese C. articulata, which is now found in a good many gardens, and which bears its smaller fruit much more scattered over the branches, but quite abundantly. While the interior arils of this species are also scarlet, the outer sides of the pods are of a light orange color at this season. The Matrimony-vines, especially Lycium Chinense, claim attention by their bright scarlet fleshy berries.

The Barberries are noted for their bright red or reddish fruit, but at the end of November, and after numerous severe freezings, the berries of the common Barberry, Berberis vulgaris, of Europe, have lost much of their lustre and plumpness. The native B. Canadensis of the Alleghany Mountain region has smaller fruit, but it is still bright red and and fresh and full-looking. It is not so attractive, however, as the Japanese B. Thunbergii, which has been so often referred to in these pages, and which keeps its berries fresh-looking until spring.

Grewia parviflora, a plant classed in the Linden family, gives promise of value for showy fruit, although it does not yet appear to be very hardy in this climate. It was introduced into the Arboretum from northern China about 1882. The flowers are not showy, but are produced during a considerable time, and the fruits, which are about the size of peas, are laterally flattened, firm, smooth and shining and of a brownish orange color. They have, so far, been produced very sparingly here, so that the plant cannot be recommended for planting in this climate, but in a milder region it may prove of some value as an ornamental-fruited shrub.

The high Cranberry Bush, Viburnum Opulus, is well known. It still retains its large cranberry-like fruit, but after having been frozen several times it has become somewhat shriveled, and the color is of a duller red than it was earlier in the season. The fruit of the Flowering Dogwood, Cornus florida, is rarely allowed to remain on the plants so late in the season because certain species of birds are very fond of it when fully ripe. But, if not disturbed, much of the fruit would remain on the trees throughout November and keep plump and fresh and retain its characteristic brilliant red color.

Some of the single or wild Roses are bright with reddish fruits at this season. Rosa Carolina and R. lucida are among the best of these. R. multiflora has innumerable firm fruits of a bronze-olive color at this season; those of R. repens are dull red, and of Rosa spinosissima a dark maroon. On many Roses the fruits or "hips" have dried and turned brown or black, but on some, like the Dog Rose, a large portion still appear fresh, though of a dull red color.

Few of the Hawthorns are noted for effective display at the beginning of winter, but the Washington Thorn, Cratægus cordata, keeps its fruit in a clear, lustrous, attractive condition, and as the species grows into a small tree it stands above most other plants noted for this quality. The Cockspur Thorn, C. Crus-galli, holds large, dull red-colored fruits. Cratægus Pyracantha, of Europe, is also well worth growing, although not perfectly hardy in this latitude. When only a few feet high it bears fruit abundantly of a bright scarlet color, which keeps fresh and bright all winter. The Cotoneasters are not well known, perhaps, because they offer little showiness of bloom. But several of them have noticeable fruit just now. That of C. acuminata is plump and of a dull purplish-red color; the fruits of C. vulgaris are dull black, while those of the little evergreen, C. mycrophylla, are of pure red, but lustreless. If not previously eaten by birds the bright red fruits of the European Rowan-tree and our native Mountain Ashes are not be overlooked, while the little Pyrus arbutifolia firmly holds its dark or purplish-red fruit in good condition. Some of the flowering Crab-apples retain their little apples in great abundance, but they usually become dull-colored after several freezings and thawings.

Climbing Honeysuckles, like Lonicera Sullivanti and L. flava, sometimes keep good color in their fruits.

One of the best of hardy shrubs at this season is the Coralberry or Indian Currant, Symphoricarpos vulgaris, which regularly has its branches thickly covered with small purplish-red or magenta colored berries. It is a slender shrub, quite effective when planted in masses, as it has been in the parks about Boston.

In striking contrast with these dark fruits are those of the well-known Snowberry, Symphoricarpos racemosus, which before the snow falls appear of the purest white. If grown in partial shade or out of the full rays of the autumn sunshine,

these berries keep their freshness and color for a long time. This may be considered the only good white-fruited plant at this season. Others, like the western Symphoricarpos occidentalis and the Poison Sumachs, have whitish fruit, but it is dull white and not attractive. The Bayberry, or Candleberry, Myrica cerifera, is not particularly showy, but its persistent blue-gray fruit is clear and attractive.

Among black-fruited plants the common Privet, Ligustrum vulgare, is the best, as its shining clusters keep fresh for a long time. A yellow-fruited form is occasionally seen. The fruit of the Asiatic L. Ibota is black, but with a persistent rich bluish bloom. The white blossom of Rhodotypus kerrioides is followed by three or four erect shining black or chestnut-brown akenes, which persist throughout the winter. Viburnum acerifolium sometimes holds its clusters of black drupes in a fresh and shining condition until quite late; but, although the fruit of the Sheepberry or Sweet Viburnum, V. Lentago, persists, it becomes somewhat shriveled and loses its lustre, and this is also true of V. cassinoides.

Hardy shrubby plants with pappus-bearing fruits are rare in this latitude, but the Groundsel-tree, Baccharis halimifolia, thrives, and the pistillate plants are covered with the gray pappus in the late autumn.

Arnold Arboretum. *J. G. Jack.*

Primula Forbesii.—This is a new species sent to Paris by Abbé Delavay from the province of Yun-nan, China. It was this year introduced to general cultivation by Messrs. Vilmorin. Seed sown early in the year quickly made flowering plants, among which no differences either of foliage or flowers have appeared. The leaves are dark green, somewhat hairy, elliptical and toothed. The flower-scapes are radical, slender, and bear at varying heights three or four rows each of six or eight flowers, which are individually small, about a third of an inch in diameter. These are blush rose, with yellow eyes. The plant is very prolific of flowers, and the introducers report that the original plants have been quite continuously in flower for several years. This species, while distinct and attractive, has a rather delicate and quiet order of beauty, and will not prove so general a favorite as either P. obconica or P. floribunda. It is probably not a hardy species.

Ostrowskia magnifica seems to be giving trouble to many growers, and a friend has reported several failures with this interesting plant. I, therefore, uncovered the root the other day to examine its condition. As it was firm and strong buds were showing, it is evident that the position and conditions have suited the plant, and it may be helpful to add to my note in Garden and Forest of June 28th, 1893. It is planted in a raised south border, protected by the house, and is in sandy loam. As it is next to a collection of Oncocyclus Irises, and ripened even before some of these, being also an Asiatic plant, it struck me that the same treatment might suit it. Therefore, as soon as the stems disappeared I have, for two seasons, placed a frame of glass over it and kept it as dry as possible till late in August. The border is so protected that it receives very little rain at any time, and it has been very dry during the summers. Since the plant has flowered and made constant progress in strength, it is probable that my tentative culture is the proper one.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

The Rust of Mountain Ash.

To the Editor of Garden and Forest:

Sir,—I enclose you a few leaves of the Mountain Ash, which, as you will see, have long excrescences on the under sides. The trees hereabout seem in good health up to September, when they begin to be affected, and the trees become unsightly. The general health of the trees does not seem to be injured, for they start off as vigorously as usual the next spring. Will you be kind enough to inform me whether this is the work of an insect, and, if so, what remedies can be used against it?

Bar Harbor, Me. *B. J.*

[It is not unusual in the autumn to find the leaflets of the Mountain Ash more or less blotched with red upon the upper surface, while long protuberances opposite to these extend from the under side. This gall-like appearance naturally suggests the work of some insect; but the malformation is due to a fungus belonging to the group of the true rusts. It is an instance of a fungus which exists in more than one state during its life-history. In one form it infests the common Juniper or Red Cedar, where it forms small galls upon the leaves and branches, much smaller than those caused by another species which produces the large Cedar-apples, so called. This fungus is known as Gymnosporangium globosum, Farl.; and the form found upon the Mountain Ash is called the Roestelia state, above briefly described. It also infests various species of the Hawthorn, and also the common Apple. In this latter it is often noticed that the Roestelia state of two species of Gymnosporangium are closely associated. We may also have upon the same small branch of the Red Cedar two species of Gymnosporangium—namely, G. globosum, Farl., and G. macropus, Lk.—and upon the Apple the Roestelia forms of these same two species.

The important practical point is that this rust of the Mountain Ash grows in one of its stages upon the Cedar, and, therefore, it is probable that the presence of Cedar-trees in the vicinity of the Mountain Ash is necessary for the development of the Roestelia form. If it were worth while to try to conquer this rust it might be advisable to destroy Cedar trees that are growing in the vicinity of the Mountain Ash-trees, but, perhaps, the Red Cedars will be considered worth more than the others.—*B. D. H.*]

The Chrysanthemum Shows.

To the Editor of Garden and Forest:

Sir,—Besides the exhibitions this year in the large cities, there were many successful Chrysanthemum shows in smaller towns. The one held in Pittsfield, Massachusetts, compared favorably with those in the great cities, and was ahead of them from an artistic point of view. A pleasing feature of this exhibition was a children's show. In the spring a thousand plants had been given by a leading florist to the school-children and prizes were offered to those who exhibited the best plants in the autumn. There is a town of 10,000 inhabitants in this vicinity, and two or three gardeners have agreed to furnish a committee of school-teachers one thousand plants. The duty of the teachers will be to get out a schedule card containing a few instructions as to the best methods of cultivating the plants and the most effective ways of exhibiting them. The teachers will endeavor also to solicit the patronage of prominent townspeople, and they have every hope of success. This plan, with modifications to suit different localities, could be adopted in many towns of similar size with little expense and great benefit to the community. No doubt, florists and gardeners would be glad to furnish these plants from motives of public spirit, and yet they ought to remember that the cultivation of an interest and love for plants and flowers among the rising generation is the surest guarantee of their own success in the future.

Judging.—Where judges are all florists it is naturally supposed that they will estimate the value of a flower from the florist's standpoint, and a flower as large as a dinner-plate, with the leaves close up to the blooms, will invariably get the prize. There ought to be a chance, however, for the hardy little Pompons, the graceful Anemone-flowered ones and the neatest of the Chinese incurved; while, as regards foliage, it ought to be borne in mind that many varieties produce their best blooms only on crown-buds, blooms on a terminal bud being altogether out of character. By the very nature of a crown-bud there is little probability of any foliage nearer than six inches from the bloom, and often not within twelve inches. Certainly these facts ought to be taken into consideration when judging. Mr. Gerard's suggestion in behalf of the old-fashioned board-exhibits has considerable weight in the case of these crown-bud flowers. I certainly should not have flowers shown exclusively on boards, but such displays can always be made very interesting features of a show, and they would enable us better than any other way to judge the merits of a single bloom. Still, the boards ought to be arranged differently, for there is no need having the blooms lie entirely flat. It was customary years ago to lay some fine green moss over the board, which gives it a velvety appearance quite pleasing to the eye and affords a little refreshing moisture, besides being a more congenial rest for the blooms than dry, stiff white paper.

Specimen Plants.—Many failures to raise good specimen plants come from the practice of selecting varieties which take the lead in the production of specimen blooms instead of from plants which make good specimens themselves. The

qualities required in a plant for a specimen are a low bushy habit, good foliage which holds on well, and full blooms of lasting quality and decided color. I add a list of well-tested varieties for specimen plants. Crimson: Mrs. Shrimpton, William Seward, Cullingfordii, G. W. Childs. Red: Tupelo, John Laing, Robert McInnes. White: Parthenia, Joseph H. White, Ivory, W. G. Newitt, White Gem. Pink: Enchantress, Louis Boehmer, Duchess of Connaught, Eda Pras, Needles. Yellow: Wm. H. Lincoln, Gloriana, Miles A. Wheeler, Mrs. Bishop, Golden Ball, A. H. Fewkes, President Hyde. Blush-white: Mrs. Joseph Rossiter, Wm. Falconer, Etoile de Lyon, G. Daniels. Orange: Hicks Arnold, Walter Hunnewell, Col. W. B. Smith, Mrs. W. G. Baker. Straw-yellow: Fascination. Crimson incurved: C. B. Whitnall.

Wellesley, Mass. *T. D. H.*

Recent Publications.

American Big-Game Hunting. Edited by Theodore Roosevelt and George Bird Grinnell. New York: *Forest and Stream* Publishing Company.

This book is a series of sketches written by members of the Boone and Crockett Club, the objects of which organization, as set forth in its constitution, are: (1) To promote manly sport with the rifle; (2) to promote travel and exploration in the wild and unknown, or but partially known, portions of the country; (3) to work for the preservation of the large game of this country, and, so far as possible, to further legislation for that purpose and assist in enforcing the existing laws; (4) to promote inquiry into and to record observations on the habits and natural history of the various wild animals; (5) to bring about among the members an interchange of opinions and ideas on hunting, travel, exploration, various kinds of rifles, the haunts of game animals, etc. While the club devotes itself primarily to sport and the protection of game, nevertheless, in a trip after wilderness-game, the hunter is often obliged to traverse regions which are imperfectly known, so that not a little original exploration has been accomplished. Many sketchy surveys made in this way have appeared in various periodicals and in Government reports, but the present volume is devoted almost exclusively to the hunting of big game and questions of game preservation, as the following attractive list of subjects will show: A Buffalo Story, by George S. Anderson; The White Goat and His Country, by Owen Wister; A Day with the Elk, by Winthrop Chanler; Old Times in the Black Hills, by Roger D. Williams; Big Game in the Rockies, by Archibald Rogers; Coursing the Prongbuck, by Theodore Roosevelt; In Buffalo Days, by George Bird Grinnell; Nights with the Grizzlies, by W. D. Pickett; Yellowstone Park, by Arnold Hague; A Mountain Fraud, by Dean Sage; Blacktails in the Bad Lands, by Bronson Rumsey; Photographing Wild Game, by W. D. Devereux. These articles are accompanied by many engravings and half-tone pictures, which really illustrate the text, although some of them are not examples of the best art. No one who has ever enjoyed wild life, even for a short vacation season, can listen to the bare recital of topics like these without having his pulse quickened. They bring reminiscences of rough riding on the plains, of mountain trails and forest camps, of alpine meadows populous with elk, of inaccessible rocks on which the white goat stands sentinel, of mountain streams which come foaming down from everlasting snow, of broad landscapes whose unspeakable beauty has never been marred by man, of long days full of rapture and nights as full of rest.

Particularly within the scope of this journal, however, come the chapter on Yellowstone Park, and another on our forest-reservations. More than twenty years ago, while the Yellowstone region was still almost entirely unknown, Dr. F. V. Hayden foresaw that it would soon be despoiled unless its curiosities could be preserved in their natural condition by Government protection, and he therefore urged the enactment of a law establishing this park; and the report of the Public Lands Committee recommending the passage of the act, after pointing out the worthlessness of the region for agriculture or for settlement, closes with these words: "The withdrawal of this park, therefore, from sale or settlement takes nothing from the value of the public domain and is no pecuniary loss to the Government, but will be regarded by the entire civilized world as a step of progress and an honor to Congress and the nation." This great reservation of something more than 3,300 square miles, and at an elevation of 8,000 feet above the sea, was therefore dedicated and set apart as a pleasure-ground for the benefit and enjoyment of the people. It was an act with far-reaching consequences, not only because it saved this great stretch of mountain, valley and plateau, with its open park-like grass-lands and leagues of unbroken timber; it not only protected the streams which take their rise in this elevated region, and left a home where the elk, moose, antelope, mountain sheep, buffalo and other big game could find in its great diversity of physical features all that they require for a shelter and food, with seclusion for rearing their young; but it did much more in that it established a precedent which made it easier at a later day to set apart other forest-reservations in Arizona, California, Colorado, New Mexico, Oregon, Washington, Wyoming and Alaska—more than 20,000 square miles in all. The members of the Boone and Crockett Club assert positively that in these great reservations can be found every species of large game known in the United States, and the proper protection of them would mean the perpetuating in full supply all these indigenous mammals. With proper care, therefore, no American species of large game need ever become absolutely extinct, provided only legislation is secured for properly policing these preserves. Still more important, in our view, is the climatic and economic value of these vast reservations, which are destined to play an important part in our national forest-policy when we have developed and adopted one. We firmly believe that many more thousands of square miles of forest must ultimately pass under Government control. Meanwhile it is well to remember that the forests already reserved lie absolutely unprotected. Though devoted to public use, they invite spoliation. Timber-thieves may fell their trees, and skin-hunters may kill their game, without any fear of retribution. Some of them are patroled by Federal troops, but there is no statute under which a trespasser can be punished. Every one sees the absurdity of setting apart a reservation and then leaving it without guard or government, and Congress ought at once to provide machinery for administrating this great property. We heartily concur with the statement of the editors of this book that "the timber and the game in the reservations ought to be made the absolute property of the Government, and it should be constituted a punishable offence to appropriate such property. The game and the timber on a reservation should be regarded as Government property just as the mules and cordwood are at an army post. If it is a crime to take the latter, it should be a crime to plunder a forest-reservation."

Poems of Nature. By William Cullen Bryant. Illustrated by Paul de Longpré. New York: D. Appleton & Co.

This is a collection of some forty of the best-known of Mr. Bryant's poems, each one of which is illustrated with reproductions of one or more wash-drawings by Mr. de Longpré, and many of these last are singularly effective. The landscape sketches are all appropriate and show a trained hand and an affectionate love for nature in various moods, while the details, especially of foliage and birds, are worked out with great skill. The book is admirably printed on thick paper, and it is altogether a beautiful reminder that the holiday season is approaching.

Notes.

Professor Trelease sends out his fifth annual announcement concerning garden pupils for the Missouri Botanical Garden. An examination of the circular shows that the course which originally covered six years has been reduced to four years.

The same amount of manual work is required, and the effort will be made to give as much theoretical instruction as possible in the various subjects prescribed, the aim being, primarily, to make practical gardeners rather than botanists or scientific specialists.

From Messrs. Ellwanger & Barry we have received a box of the magnificent Anjou pears, for which this firm is famous, and which grow to perfection in Rochester. No less an authority than the late Marshall P. Wilder used to call the Anjou the best all-round market pear in existence.

Experiments in grafting the Chrysanthemum on stocks of Anthemis frutescens have been highly successful in Europe again this year. A specimen of the variety Val d'Andorre, exhibited at Brussels on the 12th of November, measured nine feet in diameter and bore 783 flowers. Other grafted varieties did not make such large bushes, but bore numerous flowers of great size and of unusually deep colors. Why do not some of our American experts try their hand at this work for next year's exhibitions?

Among various plans for ripening the green tomatoes which are usually found on the plants when frost kills them, we note the advice in the *Florists' Exchange*, to spade up a piece of ground which is protected on the north side, then pull up the plants with the fruits, spread them over the newly spaded ground and cover them with straw, leaves, corn-stalks or anything which is most convenient, to keep them warm at night. The heat of the earth will ripen the fruits perfectly. The fruit does not wilt, and the flavor will be as good as if it ripened in the sun.

Pleading for an increased number of public playgrounds for city children, Lord Meath says, in a recent number of the *Nineteenth Century*, "London alone has, since the formation of the Metropolitan Public Gardens Association in 1882, increased her open spaces by 157, containing 4,998 acres, while the entire number of public parks and gardens within easy reach of the inhabitants of the metropolis is 271, containing 17,876 acres, which include 6,380 acres acquired and maintained by the Corporation of the City of London. We may roughly say that the cities and towns of the United Kingdom, including the metropolis, possess some 500 open spaces over 40,000 acres in extent."

A correspondent of the *Gardeners' Chronicle* states that fungus-hunters have never known such a general failure of the crop as there had been in the English woodlands this year. Epping Forest was scoured in September for hours without finding twenty different species of Agarics, while the number of individuals of each species was equally small. In favorable years from eighty to one hundred species would have been recorded in the same period of time, and yet in many localities there has been a remarkable profusion of common mushrooms. Tons have been offered for sale at nominal prices, and in London they have ruled lower than ever before, where they have actually sold at twopence a pound.

The foreign horticultural papers speak with some admiration of the American Chrysanthemums which have been shown at the autumn exhibitions in Great Britain. In the term American, however, they not only include seedlings raised in this country, but importations which have reached Europe by way of America. One writer, speaking of the competition between the Chrysanthemums raised in France and those raised in America, states that the best of the new introductions have come from this side of the Atlantic, and, with the exception of the new flowers sent out by M. Ernest Calvat, the genuine novelties of American growers far surpass those of all other French growers put together.

Mr. Arthur P. Hayne, writing to *The Pacific Rural Press*, states that while investigating the fungi which cause various kinds of rot in the grapes of California, he found one which may prove a genuine advantage. This is Botrytis cinera, which is essential to the production of the very best Château Yquem Saüterne as well as the Rhine wines of Johannisberg. Grapes which are covered with this mold, and are seemingly rotten, are sold for as much as $1,000 a ton. The fungus is not altogether a blessing, for when it attacks black or red grapes it robs them of their color and destroys the tannin which is necessary to make clarets. Besides this, it concentrates the sugar until it becomes impossible to make a dry wine. It is only on white grapes that it is beneficial, and it must be carefully studied and experimented with in California before its true character there can be discovered. In wet cold years it may develop before the grape is ripe, and cause it to rot before it matures, or it may develop to such an extent on the stem as to cause the loss of the entire bunch. But when it appears late on a white variety it merely decomposes the skin of the berry, allowing the oxygen of the air to act slowly on the juice and produce certain complex acids which are essential to those peculiar flavors found only in the best vintages of the white-wine region in Europe.

As many as eight steamer-loads of bananas came into this port during last week, and this large supply has had the effect of making the wholesale price at auction as low as twenty cents a bunch, while smaller bunches, known as "docks," have sold for the nominal price of ten cents. The California fruit season here is now ended, the last car-loads consisting of Cornichon, Emperor and Flame Tokay grapes; choice lots of the latter during the past few days brought as high as seventeen cents a pound by the crate. About nine hundred car-loads of California fruit have been sold in this city during the past six months. Prices are said to have averaged fully $300 less a car than last year, a result brought about by injury to the fruit through slow railroad service, as well as by the abundant supply and the prevailing hard times. Catawba and Concord grapes are still plentiful at twenty cents for a five-pound basket, and Niagaras sell at the same price, with Isabellas a trifle cheaper. Florida oranges of fair quality and size range from twenty to forty cents a dozen, and the best Navel fruit is a dollar a dozen. Mandarins are offered at fifty cents a dozen, while Tangerines are ten cents higher for selected fruit, and smaller sizes sell at eighteen cents a dozen on the street-stands. Two large cargoes of Sicily lemons have been put on the market within a week, and sales of the coarser Malaga fruit have consequently declined. Some select Majori lemons are selling at the usual high prices which this choice grade of fruit readily brings. Dainty little Lady apples are thirty cents a dozen. A large variety of the English filbert, known as the Kent cob-nut, is now sold in the husk at seventy-five cents a pound. These improved nuts are comparatively rare in this market, and in former seasons they have commanded as much as a dollar and a half a pound.

In desert vegetation leaves are modified to economize a scanty water-supply, while in tropical forests, where there are daily thunder-showers and where the sun's rays can scarcely penetrate the thick foliage, the retention of moisture on the leaf would interfere with transpiration, and transpiration is connected with the rise of water in the stem to supply food to the assimilating organs. Mr. E. Stahl has been making a study of leaf-forms in relation to the rainfall, chiefly in the Botanic Gardens of Buitenzorg, and he states that while a great leaf-surface partly provides for this function there are distinct methods by which plants are helped to dispose as speedily as possible of their superabundant water-supply. One of these is the adoption of the sleeping position by leaves, such as those of the Sensitive Plant, so that when the horizontal leaves bend upward the rain-drops run off by the base of the leaf. Most frequently, however, excessive moisture is drained off by long points to the leaves. These points occur on the lobes of divided leaves, but are most remarkable on long ovate leaves, such as those of Ficus religiosa. In some plants the prolonged midrib has the form of a wide channel, but generally it is that of a tapering and narrow point, slightly curved at the end. As the water trickles down the inclined narrow points it passes from the upper to the under surface before dropping from the leaf, and the bent tip accelerates this action. Stahl tested this theory by experiments and found that the leaves of Justicia picta, which he carefully rounded, retained moisture for an hour, while those with the dropping points left on were dry in twenty minutes or less. This rapid removal of water from the leaf lightens its weight, helps transpiration and cleanses the surface. In verification of this we are reminded that after a shower the pointed leaves of the Ash, Willow, etc., have had the dust quite washed off, while rounded leaves like those of the Oak are still dirty. In China and Japan, where there is great heat and humidity, these long points to the leaves are a striking feature in the vegetation, while plants native to the drier regions, along the shore or up in the mountains, have rounded or crenate leaves. In the eastern United States, where great heat alternates with heavy thunder-showers, these sharp-pointed leaves are more abundant than in central Europe, where the summer is drier and colder, and even within the limits of the same genus the American species have longer-pointed leaves than their European relatives, and not only on trees, but on smaller herbs generally, those with long tapering pointed leaves grow by preference in the shady woods or along the banks of rivers.